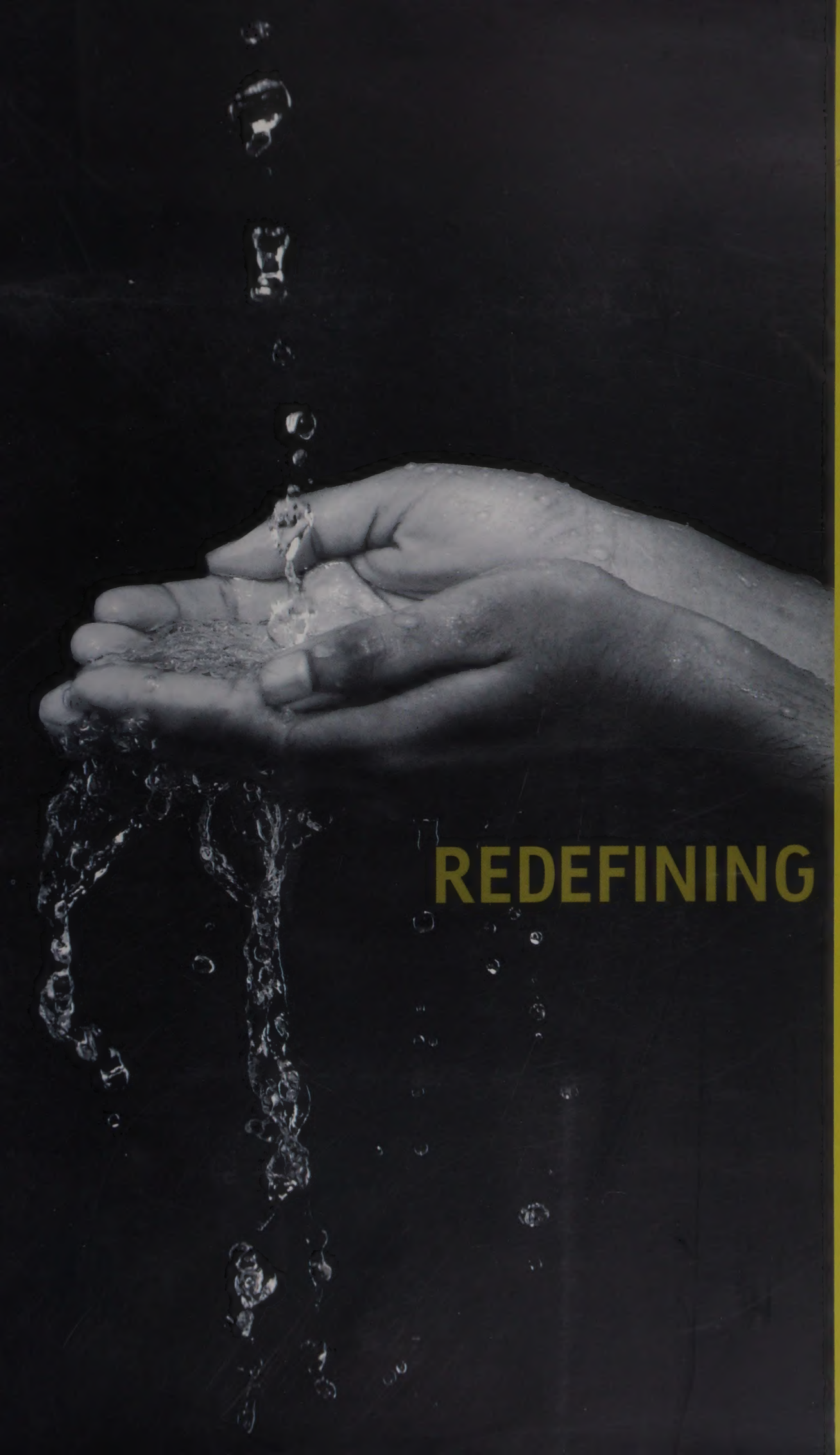

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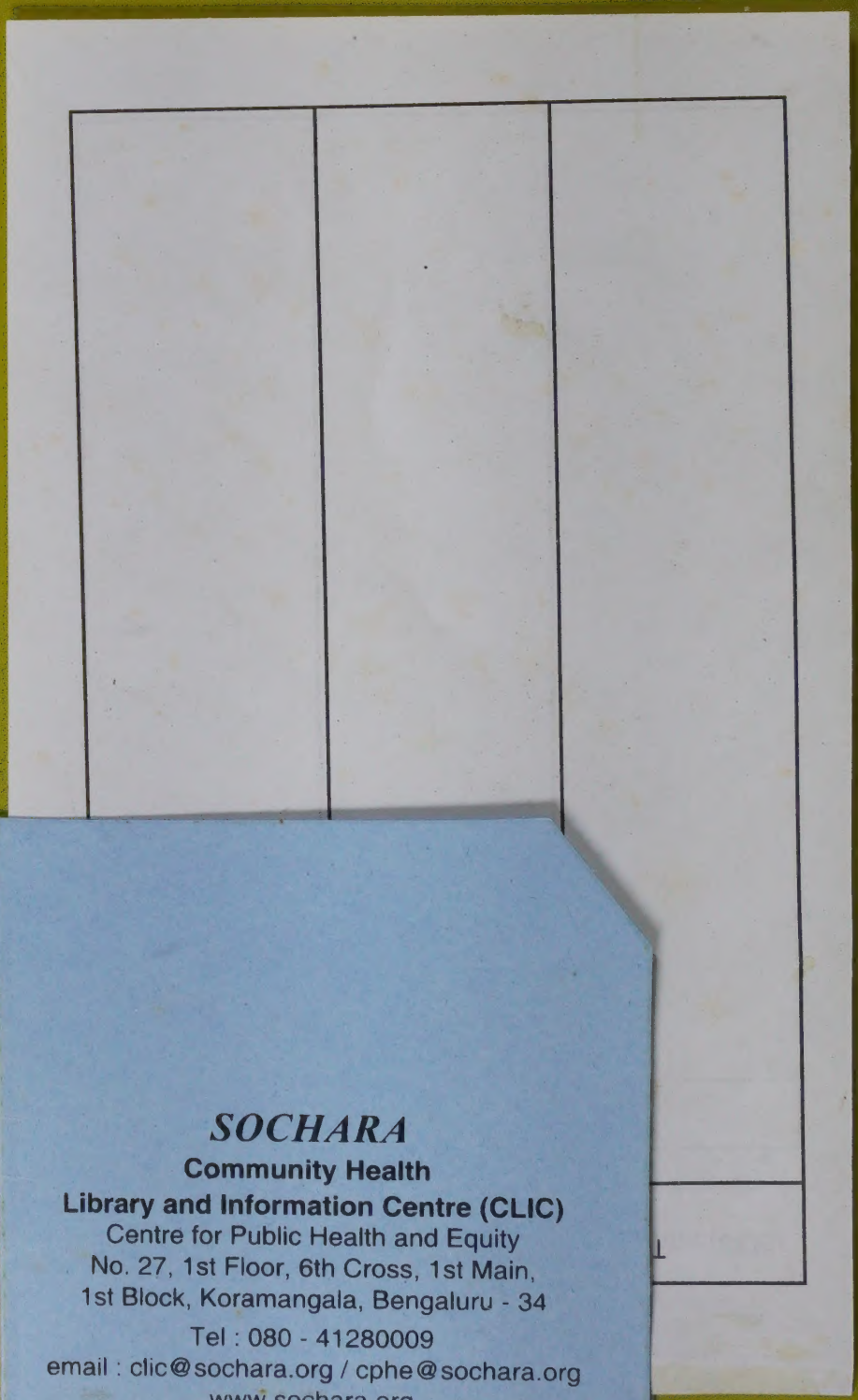

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PROGRAMME PARTNERS

FUNDING SUPPORT

EED - Church Development Services
(Evangelischen Entwicklungsdienst)
Ulrich-von-Hassell-Str 76
53123 Bonn, Germany
+49 228 81010
eed@eed.de

SOCIO-TECHNICAL AND MONITORING SUPPORT

AFPRO - Action for Food Production
25/1A, Institutional Area, D Block
Pankha Road, Janak Puri
New Delhi 110 058
+91 11 25555412
+91 11 25553652
afprodel@afpro.org

AFPRO Task Force
Pub Sarania, Bye Lane No. 4 (West)
Guwahati 781 003, Assam
+91 361 2527560
atfg@sancharnet.in

IMPLEMENTING SUPPORT

Chief Functionary
Seva Kendra
P.O. Khonsa - 786 630
Tirap Distt., Arunachal Pradesh
+91 03786 222328
+9435032189
pkgsdb@sancharnet.in

Executive Secretary
Rongmei Baptist Association
Mission Hills, 'B' Block
Jalukie Town 797 110, Nagaland
+91 03839 220279

Rongmei Naga Baptist
Association (RNBA)
Langol Tarung, Lamphel
Imphal 795 004, Manipur
+91 0385 231173
mumaipheiga@yahoo.com

Chief Organizer
Integrated Rural Development Service
Organization (IRDSO)
C/O. Mr. Tayenjam Chandrakumar
Keisamthong, Moirangningthou Lierak
Imphal 795 001, Manipur
+91 03848 222048

Secretary
Rural Women Upliftment
Society (RWUS)
Sielmat, PO Churachandpur
795 128, Manipur
+91 03874-233579
+9436024548
bethsanate@yahoo.com

Secretary
Sita Women's Development
Association (SWDA)*
Longol Housing Complex E/Iii - 63
Imphal 795 004, Manipur
+91 0385 2413389

Chief Functionary
Association For Mizoram Economic
Forum (AMEF)*
R Rozama Building
T/42, Venghlui, Chhim Veng
Aizwal 796 001, Mizoram
+91 0389 2340205

*Interventions undertaken by SWDA and AMEF have not been included in this document as these will be taken up for documentation at a subsequent stage.

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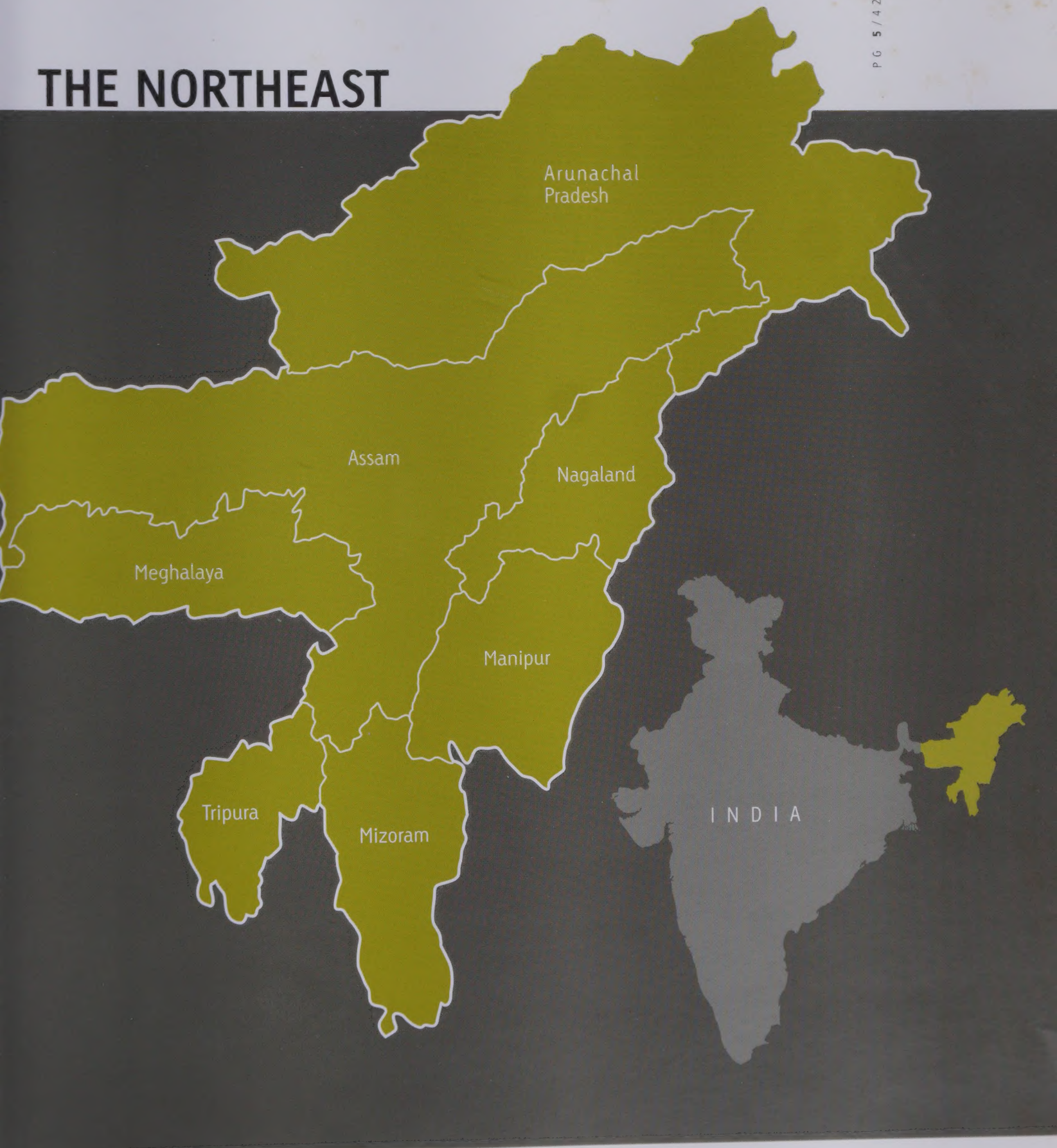
THE NORTHEAST



Graphic: Ashish Rozario

PREFACE

The Northeastern states have been blessed with abundant natural resources. But in stark contrast, the benefits of development have not accrued to them. Failures of developmental efforts in attaining planned objectives and struggles for ethnic identity have given their people a painful past. Now the growing population increases pressure on resources and livelihoods. It has become urgent that we find solutions for enhancing the quality of these people's lives. We need to focus specially on those remote villages and towns hidden in the interior that remain in a reclusive and undeveloped state.

EED (Church Development Services) and AFPRO (Action for Food Production) have been working together in the region for approximately two-and-a-half decades, concentrating on partnering with communities and local NGOs on sustainable development for patient and sustained development. Taking the shape of socio-technical development assistance, the partnerships have been in areas ranging from water and sanitation, agriculture, horticulture and small-scale livestock to development of village institutions and supportive infrastructure. In this document we share the stories of some of our recent efforts in the field of water and sanitation in the region.

Water and sanitation are critical to human lives. Safe water and sanitation practices show immediate and long-term gains - in the form of lesser morbidity and related mortality, in terms of more time to be spent at school, work or play, and in terms of transforming potentially risky home surroundings to an enabling environment of cleanliness and health.

In the states of Northeast India, our work has brought safe water and basic sanitation closer home for the poorest among the tribal villages. We have

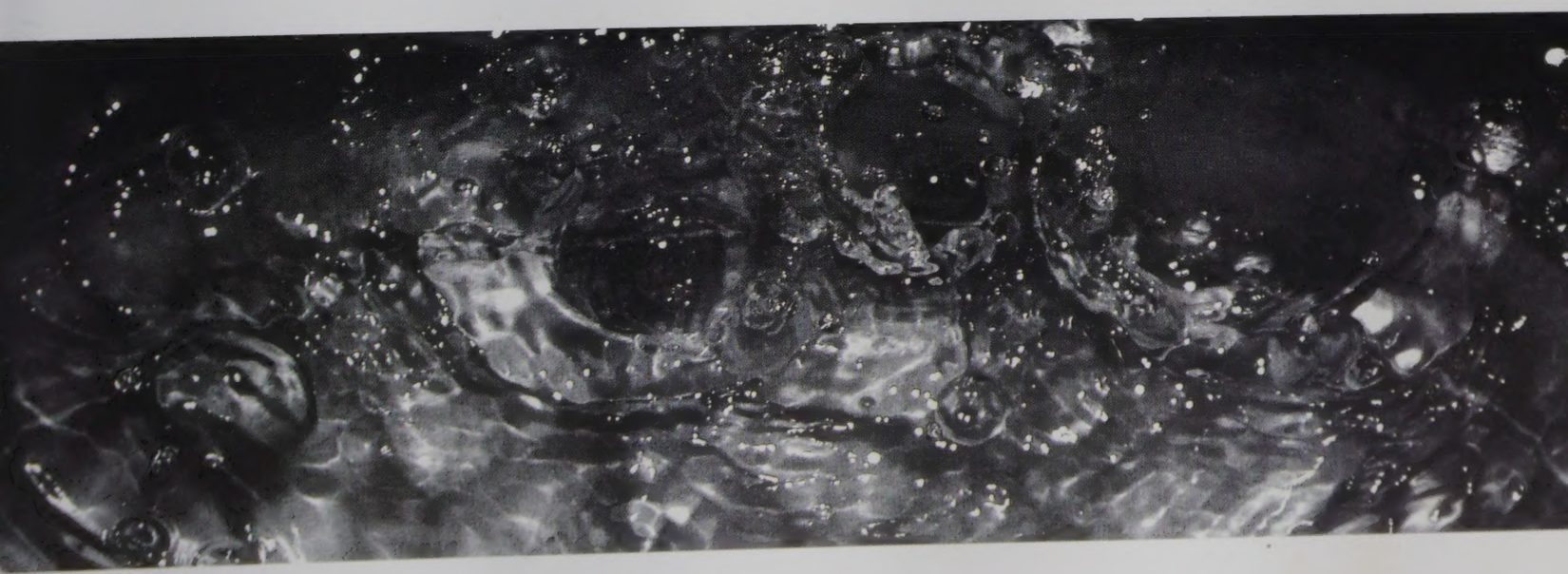
provided technical solutions, innovating on extant models in a participatory framework to ensure sustainability and affordability. This booklet outlines three innovations in drinking water and sanitation

While the projects may be minor when seen in a plethora of organized and unorganized efforts, partnering with these communities and working together for growth is what counts. The encouraging voice and presence of Civil Society in the form of partnerships for organized interventions has always been the cornerstone of change. Civil Society needs to reach out to the Northeast in a greater way, taking care that fragile cultures and minds are not violated but powered with the ability to build and educate them.

Redefining Lives, more than a simple document over-viewing our recent technological efforts in water and sanitation, is a reminder and a call - to reach out with all possible efforts, especially to North-east India.

In conclusion, AFPRO would like to thank EED for its committed and unflinching support to the development program of the voluntary sector in the Northeast. We would also like to acknowledge the collaborative spirit and partnership shown by all the local project partners. Most importantly, we acknowledge the communities that we have worked with for inspiring us with their simplicity and courage.

D K Manavalan
Executive Director
AFPRO



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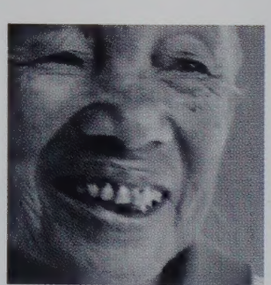
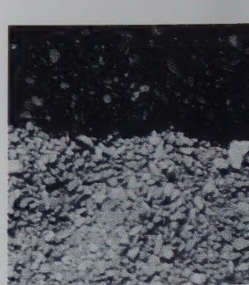




CONTENTS

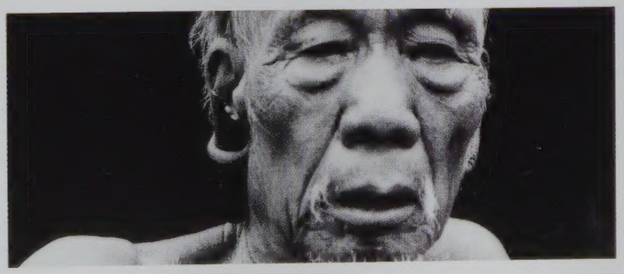
Context PG11

Bamboo Leach Pit Latrine PG17

Gravity Flow Systems PG25

Water Filters PG31

Looking Forward PG37



CHAPTER 1

THE CONTEXT

Water and Sanitation in the Northeast

The mesmerizingly beautiful Northeastern region of India is located between 20° N and 29° 30'N latitudes and 89° 46' E and 97° 30' E longitudes. Comprised of the seven states of Arunachal Pradesh, Assam, Nagaland, Meghalaya, Mizoram, Manipur and Tripura, it is popularly called the land of the 'Seven Sisters'. The Himalayas fort up the region on the north while its east is bounded by the Patkai hills. The Arakan Yoma of Myanmar, the Chittagang and Tippera hills, and the Surma plain of Bangladesh lie on its southern frontiers.

The fact that it shares boundaries with four of India's neighbors makes it an area of strategic importance. 90% of its borders form India's international boundaries. On the north lie Bhutan and the Tibetan part of China. Myanmar stretches along the east, and Bangladesh lies on the west. The Macmohan line separates India and Tibet. The total area of the region is 255000 km^2 , representing about 8 % of the country.

According to the 2001 Census of India, the population of the Northeast is 3 crores 83 lakhs or 38.3 million, which is 3.73% of India's total. The state population densities for each square kilometer range from 340 for the most prosperous Assam, a greater portion of which is plains, to 13 for the hilly and relatively undeveloped neighboring state of Arunachal Pradesh. The population density of the entire Northeast is 150, nearly half of 324, the figure for the country. The rural urban ratio for the region is 7.33: 1, compared to 3:1, the national ratio.

A unique and fascinating characteristic of the Northeast is its tribal population which forms 12.28% of the total tribal population of India. There are 145 tribal communities settled across the region. Of these 78 have a population of more than 5000. The proportion of the tribal population in the northeast to its total population is 27.02%. But in the states of Mizoram and Nagaland it is 94.5% and 89.1% respectively. And when clubbed with the figures for Arunachal Pradesh (64.2 %) and Manipur (34.2%), the average tribal population of the four states the EED-AFPRO program concentrated on works out to be 66.08%. In Meghalaya, the tribal population is 85.9%, while in Tripura it is 31.1%. However the figure is only 12.4% in Assam.

Due to the partition of Bangladesh (then East Pakistan) at the time of India's independence, the Northeast has always been in a state of territorial isolation from the mainland. Only a narrow corridor along the Bhutan hills, averaging 40 kms and lying between Bhutan and Bangladesh, joins it to the state of West Bengal. Named Siliguri Neck or Chicken's Neck, this is 33 kms wide on the West Bengal side and 21 kms on the Assam side.

Physiographically the Northeast can be divided into The Plateau Region, The Hills and Mountains, The Plains. The core of the region is the Karbi-Meghalaya Plateaus, which represents a part of Gondwanaland or the Deccan Plateau. Hills and mountains dominate most of the states spreading across 70% of the region. While only one-fifth of Assam and half of Tripura is such, in the states of Arunachal Pradesh, Nagaland, Meghalaya and Mizoram, this fact is true almost for all of the territory, and in Manipur for 90% of it. The plains that make up 30% of the Northeast comprise of the Brahmaputra and Barak Valleys and the southern plains of Tripura.

The Northeast is blessed with bio-diversity, oil, gas, coal, limestone, and forests. Plantation crops, horticulture and vegetables are ideal for cultivation on its hills. Animal husbandry can also be taken up in its various forms of poultry, piggery and other suitable options.

A tropical monsoon climate dominates the region, rainfall averaging 200 cm. The wettest area in the world, i.e. the Cherrapunji - Mawsynram area is also found here. The monsoons reign from the months of June to September, supplying the region with two-thirds of its annual rainfall. The actual rainy season itself stretches from March to October.

Seven sets of river basins adorn the Indian North-east, the rivers being the Brahmaputra in the north, Barak-Surma- Meghna in the mid -south, Chindwin through Tizu, Yu and Manipur rivers in the east and Kaladan, Karnaphuli, Gumti and Fenny in the south and south-west. All these rivers are international, flowing out either to Bangladesh or to Myanmar. Thus the region has immense hydro-potential as well scope for pisciculture.

The forests cover 65% of the

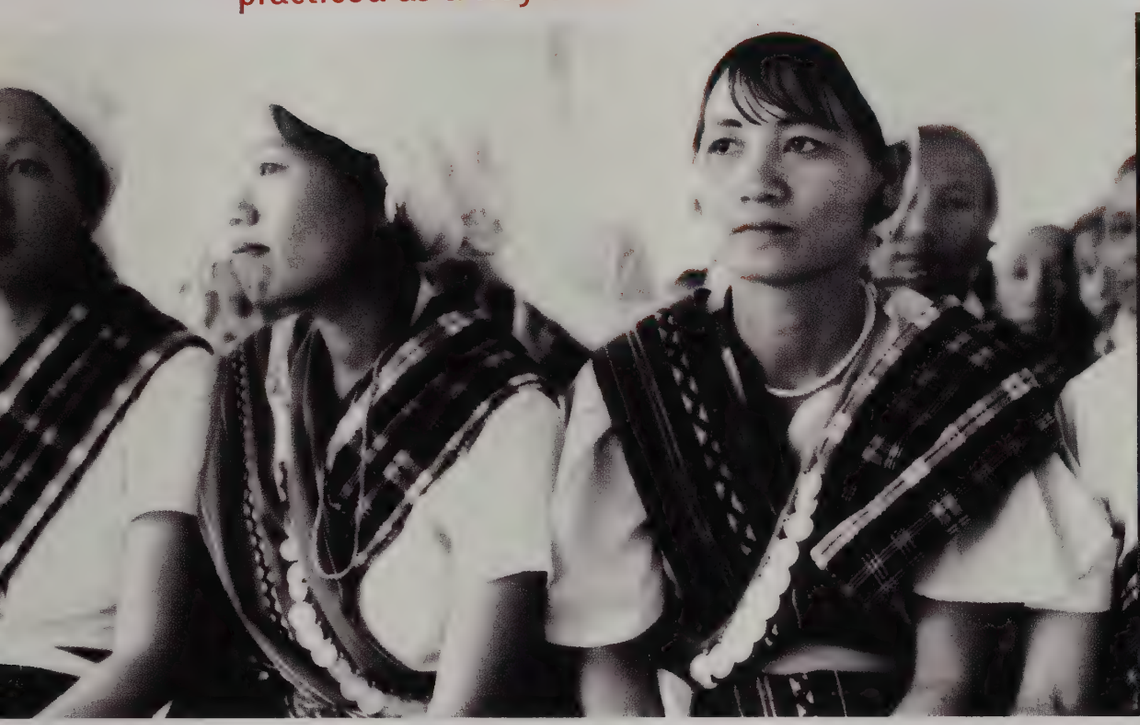
Northeastern hills. Bamboo forests are present throughout the region. The forests otherwise are of the evergreen and coniferous varieties. 85-90% of the forests are owned by the people, the rest being the property of the government. The forests have been playing an integral role in sustaining its people over many centuries in addition to an abundant of nutritional medical and subsistence goods. Forest have provided the environment for spiritual and cultural expressions of the tribal people in this region.

A word about jhum or 'slash and burn' cultivation predominant in the Northeast, which is closely woven into the villagers' life-cycle. It is a manner of shifting cultivation, varying in application, that has been historically practiced in the Northeast. Land is cleared of forests for raising crops. Once it has so been cultivated, it is left idle many years for regeneration, and then recultivated. For the poor tribals, the grain so harvested supports them through the major part of the year. Of late, there has been a reduction in the jhumming cycle, which has affected the regeneration of land. The pressures of increasing population too are having their effect in terms of increased jhumming putting a strain on the forests. Sustainable agriculture, adapted to regional needs and indigenous practices, has to be intensively promoted in the region so that its beautiful forests are preserved.

DRINKING WATER AND SANITATION

Access to water and sanitation has been considered among the Eight Millennium Development Goals. The United Nations counts it among the most basic of challenges to be met worldwide. In the South Asia region

The [illegible] mesmerizes by its beauty and mystique. The people, bamboo forests, many traditions and cultures merge to make it a fascinating place. Varying from tribe to tribe, these form an exquisite and delicate fabric - be it the clothing and jewelry, or the village king's house with skulls of buffaloes and 'mithuns' decorating it, or the Jhum farming that has been practiced as a way of life.



alone, 215.8 million people do not have access to safe water, while 907.1 million are without access to basic sanitation.

A WHO Study Group in 1986 formally adopted a definition of sanitation - 'the means of collecting and disposing of excreta and community liquid wastes in a hygienic way so as not to endanger the health of individuals and the community as a whole' (WHO, 1987).

Globally, about 250 million people suffer from water and sanitation-related diseases each year, and over 3 million die annually - most of them women and children. Diarrheal diseases alone claim the lives of more than two million young children each year in the developing world.

In the 2001 Census of India, the number of households in India having water closet latrines (sanitary water flush latrines or those connected to septic tanks or underground sewerage) was found to be 34.6 million, which is 18.02% of the 191.96 million households surveyed. The state with the highest proportion of households having water closet latrines is Kerala, having 6.6 million households or 65.19% covered. Compare these figures with those of Arunachal Pradesh where 0.023 million households or 11.02% of the 0.21 million households surveyed have the facility. The figures are lower for Nagaland and Manipur. Nagaland has only 8.72% or 0.029 million of its 0.33 million surveyed households possessing the amenity, while Manipur's 0.39 million surveyed households had only 8.68% or 0.034 million making the category. When ranked in the list of 35 states and union territories of India, Arunachal Pradesh, Nagaland and Manipur are placed at 31, 30 and 27 according to number of households having water closet latrines and 26, 32 and 33 according to proportion. The remaining states of the Northeast are not far better - Tripura with 11.69% coverage is at rank 24, Meghalaya with 12.32% is at 22, Assam with 15.90 % at 19 and Mizoram with 19.53% at 16.

Similar ranks came up vis-à-vis the Northeastern states even in the survey for households having a source of drinking water within premises. Arunachal Pradesh ranked 28 in number and 20 in proportion with 0.069 households or 32.4% covered. Except for Assam which is ranked at 14 and 17 respectively, the remaining 5 states are placed lower. Nagaland, placed at 27 in both rankings, has 22.9% or 0.076 million households with such a facility. Tripura follows, placed at 28 according to proportion with 21.8% coverage amounting to 0.144 million households. Similarly Meghalaya is at 29 with 20.1% coverage representing 0.084 million households, Mizoram at 31 with 19.6% representing 0.031 million households and Manipur at 35 with

11.9% representing 0.047 million households. The national figures are 39% amounting to 74.8 million households out of 191.96 million. The northern state of Punjab ranks first with 85.5% or 3.65 million of its households having a drinking water source within premises.

Safe drinking water and sanitation remain among the major challenges of the villages in the Northeast. The magnitude and nature of the problem in rural areas is made diverse due to limited developmental activities.

Diseases are common in rural areas, due to which women and children much affected. Water-related diseases are the single largest cause of sickness and death in the world and disproportionately affect poor people. These include:

- Faeco-oral infections that cause diarrhea and include cholera, typhoid and dysentery. They can be spread by contaminated water or more often, by poor hygiene;
- Skin and eye infections, including trachoma, which is a major cause of blindness;
- Various worm infections, including guinea worm and schistosomiasis many of which are caught by wading in contaminated water;
- Diseases spread by insects such as mosquitoes that breed in water

Better sanitation provides real personal benefits in the form of greater privacy, convenience, safety and dignity - aspects particularly important for women and girls. A young lady Phungalalung from Rongdai, Nungba, in Manipur was understandably silent when she was asked about the problems she had to face before she got a latrine in her home. Women find it an affront to their dignity to defecate in the open, and often have to walk great distances to find a private place. In the rainy season, this daily task becomes hazardous, with slippery hillsides to be contended with.

The average annual rainfall of Northeast region is more than national average. However due to improper management of available water sources as well as topographical constraints, water for drinking as well as irrigation is a problem.

The EED-AFPRO initiative has had a broad focus on poverty alleviation through timely grants and technical innovations. Improving water sources and ensuring safe, sustainable and low-cost sanitation are among the main goals. The association was started in 1979, and continues till date. It has worked through the Drinking Water and Sanitation Decade (1981-1990)

The next three chapters present our experiences with Bamboo Leach Pit Latrines, Gravity Flow Systems and Horizontal Roughing Filters-Slow Sand Filters. The last chapter briefly looks at some general learnings, a few strategies for the future, and the potential of Rooftop Rainwater Harvesting for the Northeastern states.

CHAPTER 2

BAMBOO LEACH PIT LATRINE

A low-cost solution for sanitation

Villages Nginnu and Ngissa are hidden deep in the interior of Tirap District of Arunachal Pradesh. Administered by local 'rajas' or kings, the villages serve as a stark reminder of the unfinished agenda of development. The king of Nginnu is the king of neighboring villages, including Ngissa, having jurisdiction over the village king. The kings practice polygamy, and lives like his subjects in houses made of bamboo. The clothing too has an ancient look. While the younger generation is more informed and dresses in modern clothing, many in the older generations still prefer to wear only the traditional waist-cloth or skirt. The practice of sanitation extant is the trip to the jungle or recourse to the simple open-pit latrine. An indigenous latrine called 'Kamki' stands out for its practical ingenuity in providing a solution but falls way short on the hygiene front.

In terms of sanitation, Nginnu and Ngissa serve as a microcosmic model of most villages of remote rural Northeast. Here hygiene and sanitation are urgent and largely unaddressed needs, especially with respect to safe disposal of human excreta. The inconvenience and insecurity of the common practice of open defecation, especially for women and girls, though not voiced, are threats to dignity and health.

Indigenous toilets are an option. Pits with bamboo poles for squatting, or with crudely shaped toilet bowls made of tin plates, strips of bamboo or even gunny bags can be seen all over the North-east. Partially covered in most cases, these are either adjacent to individual houses, or on the riverbanks. In the hilly areas and foothills, the pits are normally slightly removed from the houses. Using these during the night or on rainy days is an onerous task. During the rains, the pits may fill up and overflow. Besides, the problem of a nauseating smell and accompanying flies is ever-present. Once the pits get full, they have to be covered up and alternate sites located. In thickly populated habitations the situation worsens due to lack of space between houses, the congestion adding to the pressure on existing pit latrines and making relocation very difficult.

The 'Kamki' latrine found in Nginnu and Ngissa is very innovative. It depends on pigs for excreta disposal. It consists of a 'chang' or bamboo platform with a superstructure, and an enclosure below it that serves the dual purposes of pigsty and excreta collection chamber. The edge of the 'chang' serves as the squatting area, such that the faeces collects in the enclosure below where the pig will consume it. It is obvious that this model falls short off any acceptable standard of hygiene and sanitation.

For the inhabitants, these are hard facts they have learnt to live with. The unease felt during throughout the day at home only heightens into embarrassment in the presence of guests. Families reported the frequent ill health of children, especially in the form of dysentery, and similar illnesses.

A study on sanitation practices from the Amarpur block in South Tripura showed that latrines are available to only about 37% of the people, while for the rest, open defecation is the only option. The incidence of diarrhea is consequently quite high - 35% of the people have reported having had diarrhea at least once. The total disease count linked directly and indirectly to open defecation is around 50 diseases, including dysentery, cholera, typhoid, hepatitis, etc.

Septic tanks and sewerage - the two common sanitation technologies internationally known to be ideal for the disposal of human excreta and waste water have proved to be too expensive for widespread installation, operation and maintenance in developing countries. The cost of a sewerage system (which is usually more than four times that of on-site alternatives) and its requirement of a piped water supply preclude its adoption in the many communities in developing countries that lack adequate sanitation.

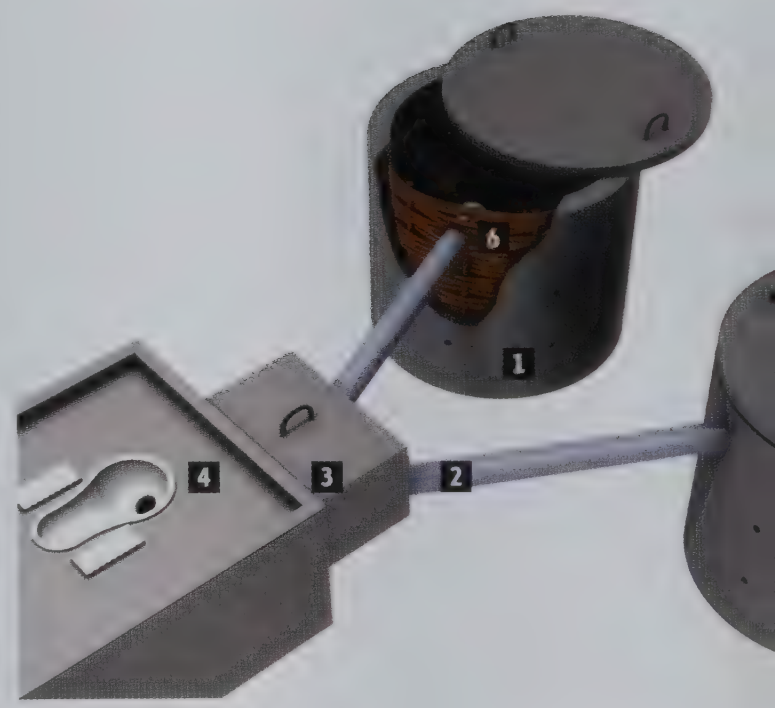
In hilly areas, such costs are anyway too high even for the average urban plan. It is not that the benefits of latrines are not clear to villagers - the problem, more often than likely, is that for these poor families, building a latrine is often the last priority. On-site disposal, dealing with excreta where it is deposited, can provide a hygienic and satisfactory solution for

such communities.

Safe disposal of excreta is of paramount importance for health and welfare and also for the social and environmental effects it may have in the communities involved. In 1954, the WHO Expert Committee on Environmental Sanitation, listed the provision of safe disposal of excreta among the first basic steps that should be taken towards ensuring a safe environment (WHO, 1954).

The problem challenged AFPRO to design an appropriate latrine that would keep construction costs on the lower side as well as provide a hygienic option. The tradition of using bamboo as a building material was the inspiration for the bamboo leach pit latrine - a twin-pit model that substitutes the use of brick with bamboo in order to minimize construction costs. Bamboo strips are woven into open ended cylindrical frames, plastered with cement both sides and used for lining the pits instead of bricks. This is cost-effective in the rural and hilly areas of Northeast areas where bricks are not easily available, very expensive or difficult to transport. The weaving also is very simple and can be done by either sex. Bricks are only required for the squatting platform as even the superstructure is made of bamboo.

For AFPRO, the Bamboo Leach Pit Latrine is more than a technical innovation: the people in whose



(Anti-clockwise) Gai Nikamlia and Lanthou,
Likro Mosang and her family, Phunzei and his grands
A widow: owners of Bamboo Leach Pit Latrines

CASE STUDY

"L-a-n-t-h-o-u", and after a pause, "G-a-i, N-i-k-a-m-l-i-a." Gai Nikamlia is an 85 year old beneficiary of a low-cost leach pit latrine, and Lanthou her 90 year old husband. They belong to village Mhainamshi in Jalukie, Nagaland. She had just spelt out her name in what seemed to be the little English she knew. Frail and wrinkled, this gentle couple's eyes reflected sadness. In September 2003, one of their sons Adon passed away at the age of 46. Adon stayed with his parents and took care of them. Of the couple's 8 children, 6 sons and 2 daughters, 3 sons are now dead. One of their sons is mentally infirm and stays with them. Understandably, the couple is facing financial problems. While Adon's wife has remarried, their other children live separately and help them within their limited means.

But Gai Nikamlia's spontaneity seems undiminished. All of a sudden, she made a profuse statement, "We thank you for this facility, it has been greatly beneficial for us, we are thankful to you". Lanthou's firm nods expressed his acknowledgement.

The low cost latrine constructed behind their house has been a boon to them in their old age. Habituated to easing themselves at the river bank, and later at roughly made open pit latrines, they are happy to have a hygienic latrine .They are now free from the burden of nauseating smells, filth and the accompanying flies: a problem that used to multiply in the rains. It is especially helpful for their infirm son.

It was Adon who took the offer forwarded by RBA, the local partner. Rev. Gonmei, Chief Functionary of RBA recounts, "Adon was initially hesitant to accept the offer as we were insisting on people's contribution towards the construction. He was of the opinion that we should bear the entire cost. The welfare approach followed earlier by developmental agencies has resulted in such mentalities. However we were firm, and explained to him that he had to be the owner. We would only support and facilitate the construction if he was willing to contribute to the resource requirement. He finally agreed to the concept. We hope everyone understands like he did."

But the couple is forced keep the latrine locked. Obviously impressed by it, the couple's neighbors have been using it without their permission. "They make it dirty and leave the burden of cleaning on us", says Gai Nikamlia.

Bangduoliu, a 70-year-old widow and grandmother from New Jalukie said, "Being women, we had to ensure that we left early in the morning for the riverside so as not to be seen by others. Now even in times of emergencies and illness, we need not go to the riverside or take care to hide ourselves. The latrine is always available. Besides, going outside always included an element of danger, but now there is no such fear. We save some time that is utilized in household and agricultural work, easing the burden on us. We also find more time for weaving garments for our families as well as for sale."

Likro Mosang, a Village Development Council member from Neotan in Arunachal Pradesh was very happy with the latrine. She said, "It is very good for our village. I am training my small children to use the latrine."

homes these models were constructed and the technical team came together to devise a way in which to minimize costs using a variety of ways. As part of this participatory experimentation, it was decided to adopt the twin pit latrine. The permanent nature of the constructed pits, facility for alternate usage of pits, relative ease of emptying the pits due to their being shallow, and optional use of the pit contents as soil conditioner after a period of two years are the features that make the twin pit latrine an obvious choice over the single pit latrine.

The advantages of the innovation were felt immediately in the houses it was constructed: reduced distance to be traversed, provision of immediate access, hygienic surroundings, and most importantly, a sense of dignity.

The demand for these latrines is reflected not just by the enthusiasm of the benefiting families, but as in Gai Nikamlia's case (see Case Study) that of the neighbors. Many others too acknowledge the difference they have experienced in their lives. They had

The advantages of the Bamboo Leach Pit Latrine were felt immediately in the houses it was constructed: reduced distance to be traversed, provision of immediate access, hygienic surroundings, and most importantly, a sense of dignity. The most important feature is that the people themselves have contributed towards the cost of the structure. These interventions have also served as opportunities for skill training.

seen such facilities elsewhere and since then desired to have their own.

Leingamleing, a 40 year old man in Rongdoi near Nungba has an artificial leg. He says, "After a fall from a tree three years ago, my left leg was amputated. Going to the forests with this artificial leg to relieve myself was highly painful. The bamboo leach pit latrine has come as a boon to me."

Though initially viewed at with suspicion by some villagers who considered the use of bamboo inappropriate vis-à-vis longevity of the structure, the technology has passed the tests for durability and extensive use in many cases, especially those of the previous program.

Phunzei, a 74 year old resident of village Samjuiram in Jalukie, Nagaland is part of a family of 8. In 1997 - 98, a latrine was constructed for his family under a previous program. "The first pit got filled up in three years, after which I directed the flow to the second pit", he says. His fellow villager, Cherbourg's household of 10 has also been using the toilet for the past 6 years. But in his case, the pit was full in two years.

Both these families have expressed satisfaction with the functioning of the latrines. Makulinliu, Phunzei's wife says, "We have noted that there has been a decrease in sicknesses among us that we attribute to this facility. The concrete covered pits are safe for children also, who used to fall into the open pits earlier." Phunzei has even constructed a small tank to facilitate storage of water for use in the latrine.

"I have been using this bamboo leach pit latrine for 2 and half years now, without any problem", says Thangzawmliem of Muolbem village. She had constructed her latrine in July 2001. The first pit is yet to fill up. Once it does, she wil empty it, dry the contents in the sun and use it as manure.

The most important feature in all the interventions is that the people themselves have contributed towards the cost of the structure. As the Case Study reveals, convincing the villagers plays a major role in the attaining this objective. For most villagers, the concept of contributing to their own 'welfare' in projects which are apparent acts of generosity is quite confounding. However, after sufficient clarification, most are open to the new mode of development assistance.

The implementation has served as opportunity for training masons as well as benefiting partners in the construction and maintenance of such structures. The beneficiaries have found the design of the leach pit latrine simple because they could fabricate and construct most of the components themselves. The bamboo mats for the pits and superstructure, and in many cases plastering and masonry work, has been taken up by family members. In fact, after seeing the design and cost-effectiveness of the latrine, quite a number of families in Churachandpur area of Manipur have made them on their own. Rangkai village reports at least three such cases while there is one at Bethel village. There are others who long to

Johnaraikhe village, Changlang District, Arunachal Pradesh

The latrines are being well taken care of. Freedom from bad odor, the flies, and the nuisance of pits flooding up during the rains, causing its contents to be strewn around have made the beneficiaries happy and confident. Shifting of pits, a frequent requirement in the open-pit system, is no longer needed. The biggest advantages are privacy, security and convenience for the womenfolk.

have leach pit latrines on their own and are exploring the resources for the same.

The latrines are being well used and taken care of. In most cases, the whole family takes turns to clean them. However, further training regarding usage and maintenance needs to be taken up. In a couple of cases the beneficiaries changed pits while they were only half-full, while in others junction boxes have not been maintained properly.

The question of ownership sometimes becomes an issue when family latrines are used by neighbors who find the latrine advantageous but do not have one of their own. While on one hand the pits fill up quickly, these 'unauthorized' users also often do not follow the procedure prescribed, burdening the owner with task of additional cleaning and maintenance. The response of owners to such intrusions is divided - while some willingly share their latrines with their neighbors, others prefer to keep them locked.

But freedom from bad odor, the accompanying flies, and the nuisance of pits flooding up during the rains strewing the contents all around have made the beneficiaries happy and confident. Shifting of pits, a frequent requirement in the open-pit system, is no longer needed. The biggest advantage, however, is the privacy, security and convenience for the womenfolk, for want of which certain villages had set special timings for use of the open pit latrines. Needless to say, this restriction on use has very often resulted in discomfort and health problems for many, especially the women, children and elderly.

An elderly couple Chawia and Tlungi from the Rangkai village,

Manipur were jovial in describing the benefits of the latrine. "The latrine is very useful and comfortable. In fact, my husband likes it very much and spends lot of time in it now." For the elderly, privacy and an undisturbed ambience are comforting.

Eight low-cost toilets have been constructed in Nginnu and Ngissa in Arunachal Pradesh. Sewa Kendra, the local partner NGO and AFPRO hopes that the effort will help initiate an atmosphere of moderated participatory development. This is essential so as not to disturb the fragile lifestyles of the people, and at the same time give them an option in living a more dignified life.

When asked about the perceived benefits of the toilets, the village committee of Ngissa said, "The latrines are very good and help improve our lives. However sudden changes cannot be brought by constructing 3 - 4 latrines in the village. Concrete, changes will only come when at least 90% of the population has this facility. As a result of proper sanitation facilities there will be fewer diseases in the village. This technology will also be taught to neighboring villages. Bamboo is readily available. Only material for construction will be required."

LIMITATIONS

There were no major technical limitations observed regarding bamboo leach pit latrines. However, the indigenous bamboo-lined pit does look less appealing to some villagers who were attracted to the brick-pit latrines and felt that given the resources they would prefer them. This may be more due to the sense of strength and prosperity that such pits would carry. But all of them were convinced about the cost effectiveness and durability of bamboo leach pit latrines.

As of now, most beneficiaries have to make trips to collect water before using the latrine. Some beneficiaries suggested the provision of water tanks near the latrine. These could be connected to the water supply system or filled at particular times during the day.

Sanitation needs to be rigorously promoted in the area. As a strategy AFPRO and the partner NGOs conducted demonstration cum trainings near community halls, schools, Vocational Training Centres and Churches in six of the North Eastern States (Manipur, Arunachal Pradesh, Nagaland, Mizoram, Assam and Tripura). These efforts need to be expanded and intensified to bring about large scale change.

Jotinkaikhe village

CHAPTER 3

GRAVITY FLOW SYSTEMS

Meeting the challenge of delivery

The 97 households of village Bethel, in Churachandpur, Manipur, had a huge problem - availability of potable water. Out of the two bore wells with hand pumps, only one worked and the iron content was reportedly high. A small stream passing through neighboring villages had dried up. They were more or less completely dependent on water from the private pipelines. The Government had provided a pipeline from the Gravity Flow System reaching the villages upstream. However, Bethel had never received any water through this system as it was tapped completely by those villages. AFPRO, RWUS - the local partner NGO, and the partner communities, worked together on a solution. A Gravity Flow System was planned and implemented. Water is now taken in from an existing spring point upstream and filtered. It then flows to a reservoir in the center of Bethel, and is distributed to three standpoints.

The most popular sources of drinking water in the North Eastern hills are the numerous springs and streams that run though the habitats. But the nearest water sources may be as far as two-three kilometers away.

As is the case in most cultures, the responsibility of collecting water for household needs falls on women - one of the most strenuous of domestic chores. The combination of the weight of water and the distances to be covered is a tiring burden.

For instance, in one of AFPRO's project villages, old Jalukie in Nagaland, the women walked a distance of about 2 kms each trip to collect water. In the rural Northeast, water is traditionally collected in hollow bamboo having a capacity of 3-4 liters. Women end up trudging back up an incline with a basket strapped over their heads, carrying 3-4 such bamboos filled with water. The load would approximately range from 10-15 kgs each trip. The number of trips depended on the family size as well as its needs and the number of women folk in the family. For many it meant that they had to make 5-6 trips each day.

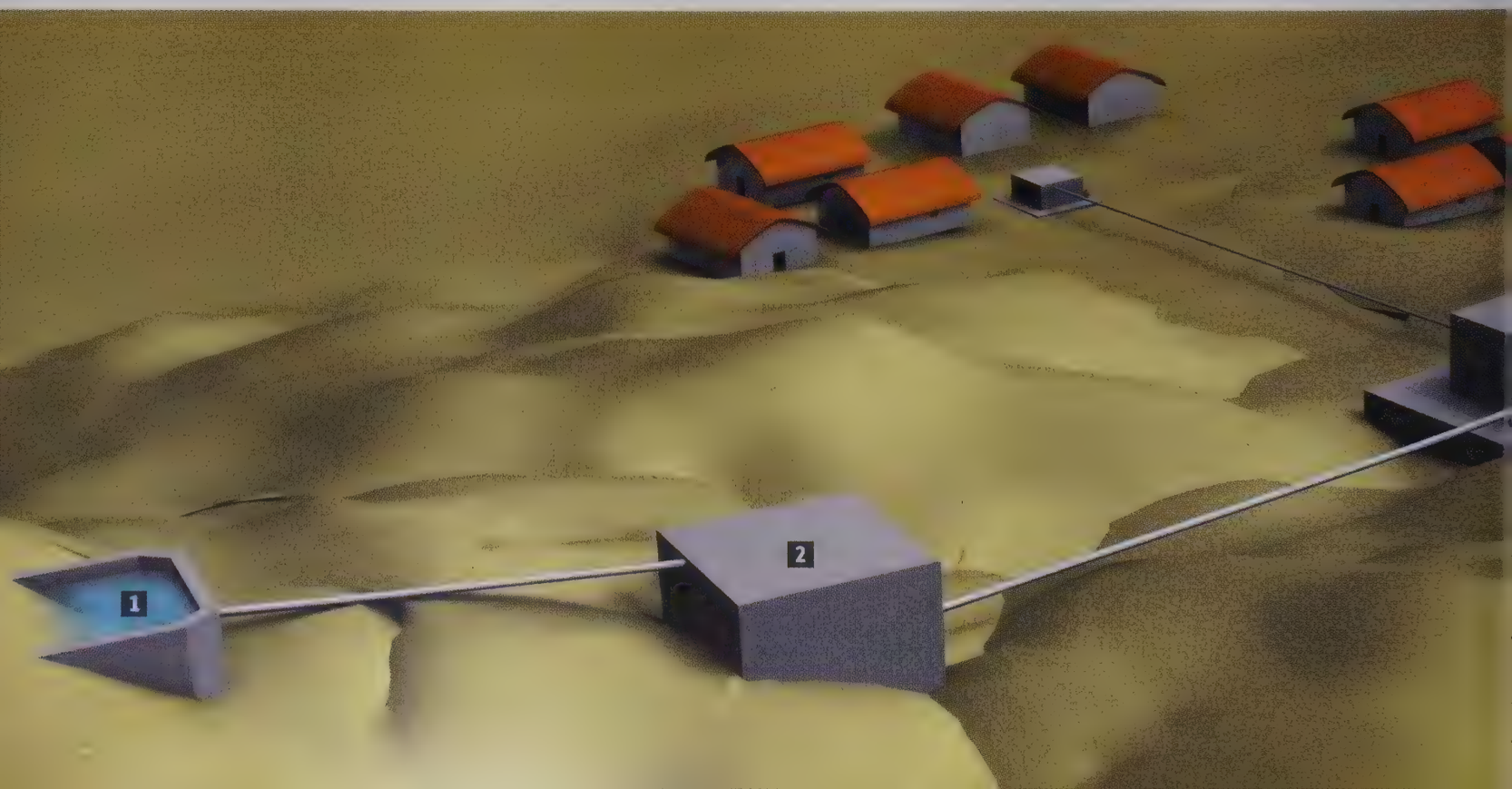
Ground water resources are unreliable due to various reasons including iron contamination. The water source then available is mostly the hill streams or springs. Women have to trek long through the hilly slopes to fetch water from these streams or spring spots. As the springs are often shallow, the process of collection is difficult and the water becomes quite muddy. The quality of the unfiltered water remains questionable especially if there are habitations on the upstream areas.

As a solution, the Gravity Flow System (GFS) stands out for its ability to tap natural sources of clean, potable water and bring it to the village A GFS is a system of distributing water that uses the action of gravity to move water from a source up on the hill, down to the village through a pipeline. It is a village level low-cost, low-input alternative to bring piped water supply within easy reach of the household.

The GFS dramatically reduces the distance to be traversed daily for water collection, especially for the womenfolk that were involved.

The nature of interventions with GFS technology have primarily taken two shapes - the first being implementing a complete system, beginning from the source to the standpoint, and the second being supporting or improving upon existing systems.

In Old Jalukie, Nagaland, an existing GFS was supplying water to the village. However the villagers were facing a problem of inadequate supply. The reason for this was the main storage cum distribution chamber which was of inadequate size and



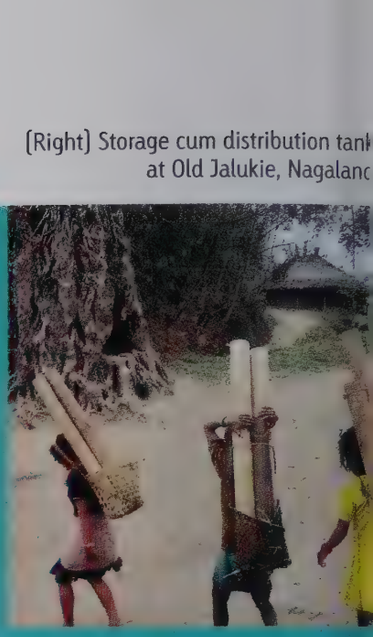
Storage cum distribution tank in Highland locality, Mhainamshi village, Nagaland

A Gravity Flow System uses the action of gravity to move water from a source high on a hill, down to the village through a pipeline. It is a village level low-cost alternative to bring water within easy reach, dramatically reducing the distances women have to trek for collecting water.

1 Intake
2 Filteration
3 Storage cum distribution
4 Distribution

CASE STUDY

(Right) Storage cum distribution tank at Old Jalukie, Nagaland



Tajeikaiphun village, nestled in Nungba sub-division of Tamenglong district, Manipur had been dependent on a single spring water source to meet its requirements. The inhabitants, about 45 households, used to trek daily to this distant spring, about a kilometer away, for fetching water. In spite of finding it poor quality, the water was precious to them as their only source.

The Government Gravity Flow System (GFS) from a source 11 kms away from the village supplies water to Nungba. But, even though the pipeline passes through the village, it does not supply water to it. RNBA and AFPRO consulted with the community and the idea of an innovated gravity flow system was adopted for the village.

It was decided that water would be tapped from this supply system, by diverting it from the pressure-release point at comparatively higher elevation in the village; this would in any case never seriously affect the water supply to Nungba. The plan was laid out in consultation with the community. Women were encouraged to participate and specially consulted in locating the sites for standpoints.

A filter point has been constructed close to the diversion point of the government GFS. A stand point has been provided to ensure access at this level. The water will now flow down through a PVC pipe of ¾" dia to a reservoir in the middle of the village.

From this reservoir, which is at a higher level compared to the rest of the village, supply has been provided to 3 standpoints at different locations in the village. In a conscious effort to avoid wastage, push-cock taps have been fixed at the standpoints. RNBA has made a variation by providing each standpoint with a mini storage tank, each with a single outlet.

A supplementary water system has also been provided from the spring source, with water directly coming down to another reservoir in the middle of the village. There is a single standpoint with a small storage tank provided just below the reservoir. Options for filtration through a boulder filter at the source or a slow sand filter midway are being explored.

The villagers are happy with the intervention, especially in the light of their being able to participate in the process. Village elder Poukak says proudly, "In some of the villages I have seen the stopcock arrangements for the stand point. In this village we have provided the push-cock tap to save water".

As women are more involved with the collection of water, the women

resulted in overflow. This wastage of water only added to the frustration the villagers. They would have liked to see it being stored so as to meet the needs of all the inhabitants. Hence RBA, the local partner NGO, the village community and AFPRO decided to go for a bigger tank. Now that the tank is in place, there is sufficient water available 24 hours at each of the collection points in the village.

The importance of such retrofits too cannot be underestimated. For Kingailule from Old Jalukie, life has now become less wearying with the regular water supply near home. She says, "I can devote more time for my husband now". Her 62 year old husband is paralyzed: she used to struggle to care for him, work at their Jhum crops, and manage the household chores, a major portion of her time being spent on trips to collect water at the river. Now with cleaner water available closer home, she saves both on time and energy.

Similar interventions have been made in RBA's project village of Mhainamshi, Jalukie, Nagaland and Sewa Kendra's project villages of Ngissa and Nginnu, Tirap District, Arunachal Pradesh. In the High Land locality of Mhainamshi village a storage cum distribution tank serving 30 households and a collection chamber with filtration unit have been constructed to strengthen the existing GFS. In village Ngissa two storage cum distribution tanks and an intake chamber have been built up to serve the 105 families. Village Nginnu has also been provided with a storage cum distribution tank.

Bathing has become easier due to the availability of water near home. The earlier practice of bathing at the river has been discarded. Children were specially vulnerable while taking bath during the floods. Now even the elderly and frail, can take frequent baths.

"Due to the tank made by you, there is water available closer to home. I can now go and take bath at the distribution tank rather than going to the river", says 85 year old Maku.

The benefits gained from getting water at their doorsteps and being involved in planning for it has started empowering people to dream bigger already. They were quite keen to get more tanks and standpoints with taps. This would help increase the efficiency

SHG members have agreed to oversee that all maintain the minimum discipline required to ensure hygiene and sanitation around the standpoints and the mini storage tanks. The village authority council has taken the responsibility to manage and maintain the GFS in partnership with the village development council.

Now with clean water for drinking and cooking available locally, the benefits, while being felt throughout the village, have specially reduced the burden on womenfolk. Whilst the distance from the main intake point in the village to the reservoir is about 1.6 km, the three standpoints are within a range of 0.5-0.7 kms in the village itself.

Lungsilal, who stays in the upper part of the village with her husband and child, says, "A lot of time is saved daily after the GFS was put into operation. There is also sufficient water available any time of the day. Earlier I had to wait for 1 hour to get our daily requirement of 4 pots of water for drinking and cooking. Now, we are also able to take bath daily near the stand point itself."

Angamliu and her mother-in-law used to go down to the spring point to collect water for their 6 member household. "Apart from the distance, the water from the spring point used to be dirty and contaminated due to waste generated from villages upstream. The water that has been made available is clean. Also, it is easier on us now," she says.

of distribution. In some places, they even asked for bathing cubicles to be constructed near the tanks.

The contribution of people in planning has been enthusiastic and generous. The PRA was used to identify village drinking water problems. The potential solutions too were explored and identified along with the people in the same exercise. Except for masons, the community supplied the labor required for construction and allied activities. In Bethel village near Churachandpur, Manipur, an individual L.T. Thalem contributed the land of the spring spot area and the reservoir.

LIMITATIONS

The source plays a major role in the success of a GFS. An elevated source at an optimal distance is the basic pre-requisite. The major limitation of the GFS is that it cannot be taken up in areas where there is no relative difference in the elevation of the source, the storage cum distribution chamber and the supply points in the village.

Cleanliness of water also affects the choice of a source. Big streams and rivers will not meet the standard for obvious reasons. Even small streams having settlements upstream would be suspect. Eventually the safest options are springs. As these are underground sources formed through percolation and filtration, the incidence of pathogenic organisms would be minimal.

Planning of a GFS is made cumbersome by difficult terrains or those that are prone to natural phenomenon like landslides. These are liable to oversight.

While the spring source is only one, it is necessary to ensure that entire communities are served through proper distribution. At the same time proper care has to be taken to minimize wastages.

Lastly, a GFS requires considerable financial inputs. The cost of the pipelines, storage and distribution reservoirs make it exclusively an intervention for the community and not the villager. Even for the community, outside funds need to be channelized towards meeting the cost of materials. The EED-AFPRO program has held that expecting any financial contributions from these economically poor households would be unreasonable.

CHAPTER 4

WATER FILTERS

Bringing potable water closer to homes

Treatment of water is essential to the concept of sanitation for health and quality of life. This understanding is obvious in homes across the Northeastern states of India where the practice of boiling water before drinking is a usual practice. Even though it consumes time and energy, boiling or heating of water has been used to disinfect household water since ancient times. It is effective in destroying all classes of waterborne pathogens (viruses, bacteria and bacterial spores, fungi and protozoans and helminth ova) and can be effectively applied to all kinds of water. However, effective filtration of water is an easier and attractive alternative.

Apart from waterborne pathogens and fine impurities, two factors that affect the potability of water are its hardness and turbidity. While hardness in water reflects the presence of salts like calcium and manganese ions, turbidity shows the presence on particulate matter like clay and silt, finely divided organic matter, plankton and microscopic organisms.

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While both are generally not characteristics that are known to be harmful to human health *per se*, they affect the palatability of water. However the colloidal nature of turbid water leads to its absorbing chemicals and offering hiding to microorganisms which may be harmful or result in an unhygienic odor and taste. It also hinders the action of disinfectants.

The Horizontal Roughing Filter and Slow Sand Filter are separate water treatment technologies that have been combined for comprehensive and effective water filtration for providing potable water in areas that have highly turbid and hard water. Once this water is treated for hardness and turbidity, it has to be filtered for finer impurities and sediments. The HRF-SSF performs both these functions.

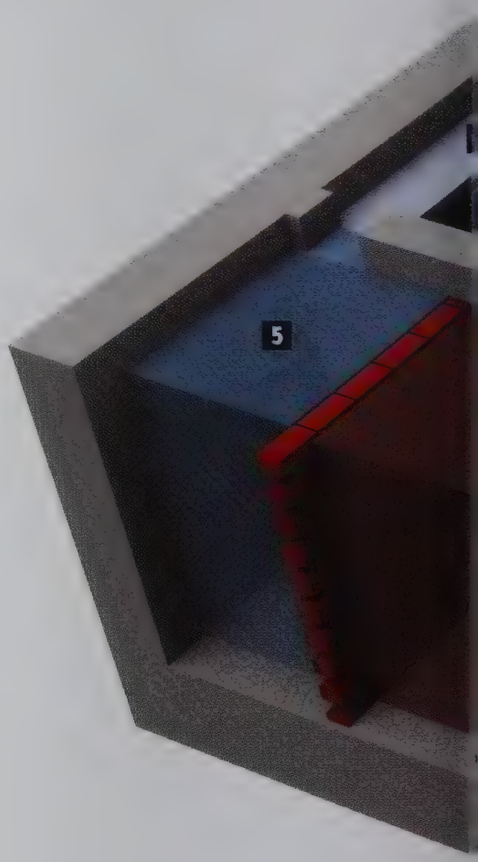
The Horizontal Roughing Filter (HRF) is a pre-treatment technology that treats raw water for high turbidity and hardness by using gravel of different sizes to filter it. These filters are known to reduce solid matter by 90% and even improve bacteriological water quality by reducing coliform bacteria.

This prepares the water for filtration through the Slow Sand Filter (SSF)- a process of water treatment by passage through a layer of sand acting as filter. The SSF filters this reasonably improved water, further reducing suspended solids, micro organisms (parasites, bacteria, cysts, etc.), iron, dissolved gases and improving the taste, color and odor. Highly turbid or hard water, with high levels of dissolved solids and high algae concentration needs pre-treatment for the SSF to be effective. In areas where the water quality is adequate, an SSF alone would be sufficient to provide potable drinking water.

HRF-SSF at Kangthokchao, Manipur

In the design provided by AFPRO, a hand pump is used to lift water into the inlet tank. From here the water passes horizontally through three chambers arranged sequentially. The first chamber contains coarse gravel (15mm), the second medium gravel (10mm), and the last fine gravel (5mm). From here water flows into the first outlet tank. Gaps are provided in the four brick walls that separate the three chambers, the inlet and the first outlet tanks for the passage of water. These gaps vary according to the size of gravel in each chamber. This forms the Horizontal Roughing Filter section of the structure.

When the outlet tank is full, the water spills over into the Slow Sand Filter section. Here it is filtered vertically through a 500 mm layer of sand (0.2 - 0.35 mm). The water is now pure. From here it flows down further through four equal layers of gravel of different sizes, and having a cumulative thickness of 200 mm. This helps prevent grains of sand from being carried forward through a drain into the final outlet tank. Water is now available for drinking and domestic use through the taps provided in this tank.

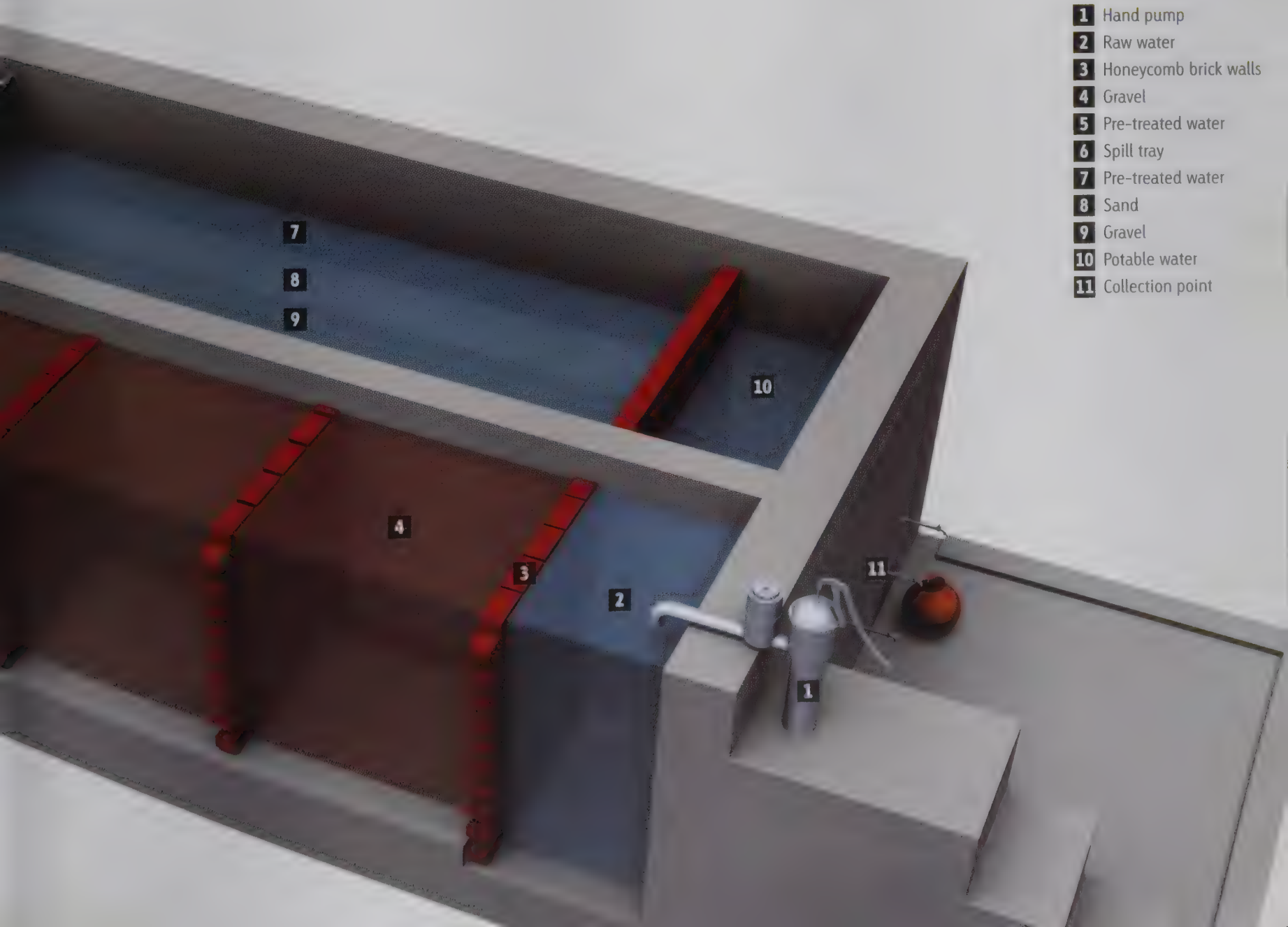


The HRF-SSF is a relatively new technology in the remote villages of north-east India. Considering their dependence on natural water resources it stands out as an effective solution. Its success in filtering water available in locally available surface and sub-surface sources make it an indispensable asset in such areas where organized water supply has yet to find its way.

The simplicity of the structure made of bricks and concrete by local masons, of course with technical support, makes it an amiable technology. Freedom from mechanical parts and dependence on natural material as filter media further add to its attractiveness for village folk. Being standardized and modular in design, the technology can be easily adopted and implemented.

An HRF-SSF has been constructed at Kangyembem village, Manipur. About 100 households are receiving potable water from it. The people themselves worked as labor during the construction in addition to contributing

The Horizontal Roughing Filter - Slow Sand Filter is a combination technology that provides comprehensive and effective water filtration to provide potable water even in the areas having highly turbid and hard water. The HRF pre-treats raw water for high turbidity. The SSF then purifies it of remaining turbidity, suspended solids, precipitates, bacteria and parasites.



INR 5000/-. Village Kangthokchao, Manipur (see Case Study) has also been provided with an HRF-SSF.

The sustainability of the structure can be gauged from the success of the HRF-SSF built under the previous program in Lamjao Awang Leikei, Thoubal, Manipur. Since its installation in 1999, no major problems have been reported.

LIMITATIONS

The major limitation of Horizontal Roughing Filter-Slow Sand Filter (HRF-SSF) is the time taken for filtration and subsequent discharge of water. In big villages like Kangthokchao, the water available for collection is insufficient to meet demand during the rush for water collection in the mornings and afternoons. Queues build up at the three outlet pipes as the rate of discharge is only 1-2 liters per minute.

For many women who come to collect water, household and family responsibilities forestall spending excess time for water collection. In such cases, the women, especially those from the distant habitations quite often resort to fetching water

Pond and HRF-SSF at Kangthokchao, Manipur

CASE STUDY

Kangthokchao village in Thoubal District of Manipur has 500 households. A huge number, till 20 years ago they used to depend on a single stream passing through the village. This also supplied water to villages upstream, affecting the flow to Kangthokchao. On the other hand the stream would get polluted from the waste generated upstream. The villagers were left with no other option but to use water from the ponds for drinking. Come summer, and the stream and ponds dry up; some ponds become muddy.

Manipur Development Society had constructed a pond in the north-west corner of the village. For the past 20 years, this pond, measuring 1.25 acres with an average depth of around 16 feet, has been the most dependable water source. According to the villagers the pond had never dried up even during the drought years. The villagers have been using water from the pond for drinking, some preferring to boil it before consumption. The water is comparatively better than that available in the stream and various other ponds in the village.

Through a PRA, the villagers confirmed to AFPRO and IROSO, the local NGO, the need for potable water but the failure of HRF-SSF programmes by other agencies in areas nearby raised doubts in their minds. These programmes had problems because the source ponds were not perennial, and subsequently the structure itself had cracked. However, as their pond was of perennial nature, it was easy to convince them of the viability of the system. The construction cost nearly INR [illegible]. The people contributed INR 2200/-. More importantly they provided labor for earth excavation and other tasks. This non-monetary contribution has amounted to INR 500/- per head.

The villagers have welcomed the intervention. Depending on the size of the family, consumption varies from two to five pots per day. Sundary and Radhika, who are neighbors say, "This pond had never dried up, even in the drought years. But the water gave off an odor and carried sediments. Now there is a definite improvement." Sundary said, "My child who is quite anaemic and sick used to get many attacks of dysentery earlier. This has now come down." Radhika too said that her child had suffered from lesser incidents of fever since the HRF-SSF was in place. The benefits in terms of better health were also confirmed by others in the village. The villagers say, "People from Salungphang and Maning-leikai are coming to collect water from our tank." After the construction of the HRF, the village has become a center for quality drinking water, not just meeting its own needs, but also the needs of people from habitations that are near, and those from far away Salungphang, who visit to fetch drinking water in pots tied to bicycles.

The village committee has taken the responsibility of maintenance. It has 60 members of whom only six are women. It has representatives from habitations all around the HRF-SSF. Each member is required to contribute INR 10/- every month. The corpus will be used for maintenance and to procure common assets. Even others who are not members of the committee expressed willingness to pay a nominal user fee in order to contribute to maintenance.

Lamjao Awang Leikei, Thoubal, Manipur

directly from the pond. One such woman Kalamcha said, "Though I am happy with the quality of water available, I cannot afford to spend as much time as is required to collect it." The women from Maning-leikai, a slightly distant habitation, said that only about 50% of them could collect water from the system while the rest of them took water directly from the pond. Similar feedback was also received from Lamjao Awang Leikei, Thoubal, Manipur.

Another important factor is the need of continuous hand pump operation to maintain a constant flow of water. If an individual fails to pump water into the HRF-SSF before collecting it, subsequent flow gets affected. In case many resort to it, the flow may eventually cease till a minimum quantum of water is filtered and a flow generated. This at times gives rise to dissatisfaction among villagers. Ganga was very clear in her point, "A guard should be appointed to see that all those who collect water from the *tanki* (tank) also operates the hand pump simultaneously."

This water, as obvious, cannot be distributed through pipes and can only be colledted at the HRF-SSF site itself. In the village Moulbem near Churachandpur, Manipur where an HRF-SSF was planned, the people opted for a Gravity Flow System on getting to know this fact.

Over a period of time filter media will get clogged with residue material and affect the rate of discharge. These need to be periodically cleaned. Besides hand pumps also need maintenance and repair.

Hence an HRF-SSF system needs to be managed and maintained by community representatives. Hand pump operation at the time of water collection must be ensured.

An important aspect of this technology is its high cost making it a tough ask even for a village to procure. But as in this program, with external support and a one time investment, a stable and immovable community asset can be established.

However, by virtue of its principle of filtration, the rate and quantum of discharge may be factors that are inherent to the HRF-SSF. While happy and convinced with the improvement in water quality, the people are eager for a time-saving innovation.

Kangthokchao is now a central point for quality drinking water. After the construction of the HRF-SSF, the village has enough potable water for itself and its neighbors. People come from far with pots tied to bicycles to collect drinking water. It is however important to continuously operate the hand pump so that water outflow remains constant.

CHAPTER 5

LOOKING FORWARD

Establishing low cost technology at the grassroots

The momentum that carries any program for development to its fruition is the spirit of partnership and collaboration. And while all partners play important roles, the benefiting partners are the most important in the team. If the EED-AFPRO program for drinking water and sanitation in the Northeast is visually juxtaposed with a project for building construction, the structures would compare with the building, and benefiting partners with the prospective owners or inmates. However, in the context of human development, our benefiting partners would compare both with the building and its owners or inmates. This is because the processes and structures have been oriented towards building up the people - their selves and their capacities.

This chapter dwells lightly on Rooftop Rainwater Harvesting - a technology that holds great promise in North-east India. It then reflects on some learnings regarding acceptance of low cost technology, future strategies and the spirit of partnership at the grassroots.

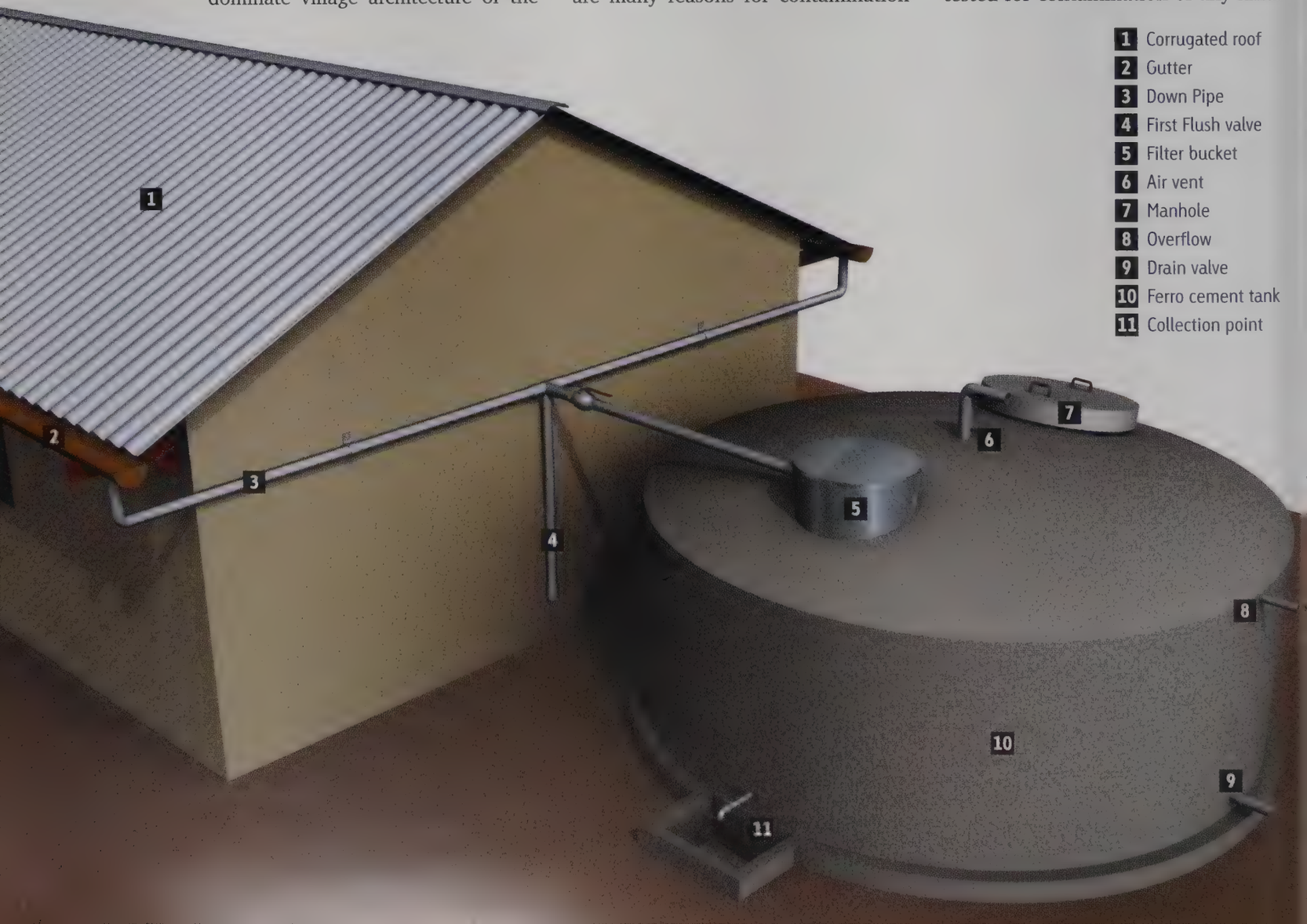
ROOFTOP RAINWATER HARVESTING

Rooftop rainwater harvesting is technology that has great potential in the villages of North-east India. As mentioned earlier, the region receives rains from March to October each year. And from June to September, the Monsoons drench the countryside. Harvested rainwater carries great potential to provide good water for domestic use. The model not only ensures catching rainwater and its storage, but also that the water remains clean and usable in times of scarcity.

However, the thatched roofs that dominate village architecture of the region impediment its large scale application. Roofs with corrugated sheets that are found in other more prosperous areas of the region are ideal for rooftop rainwater harvesting. The technology has to be adapted to thatched houses. AFPRO is currently working on developing such models that also stand the test of sustainability.

One of the major characteristics of rooftop rainwater harvesting structures is constant monitoring and maintenance for water quality. In general rainwater is pure and free from contamination. However there are many reasons for contamination of this water. Dust and debris, organic matter from bird droppings, rotten leaves, seeds, algae formation, chemicals deposited on the roof, etc all get dissolved in the rainwater and flow into the tank. Dissolved organic matter causes bacterial growth. Without proper care, even mosquitoes and other insects will breed. If the stored water is exposed to outer environment it allows the growth of algae. In areas surrounding industries, air pollution tends to affect the quality of rainwater.

Hence, it is vital that water quality in the storage tank be periodically tested for contamination of any kind.



Adequate maintenance of the structure and prescribed procedures need to be followed. All this requires that benefiting individuals and the community be trained in all aspects mentioned, including water quality testing and provided simple kits for the same.

PEOPLE AND LOW-COST TECHNOLOGY

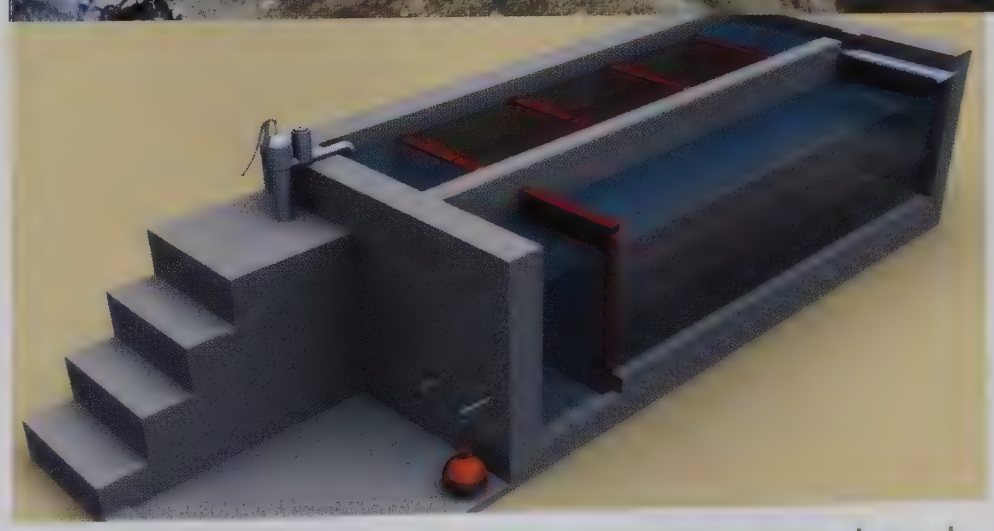
In addition to those outlined in this document, other simple alternate technologies too have been tried out successfully by AFPRO and its partners, namely spring spot development and ring wells. Due to their wide acceptability, they have not been included here.

Programs promoting low-cost technology need to be hinged on the understanding of people of the grassroots. Their participation in planning and implementation is necessary for its acceptance, ownership, mutual learning and growth. Hence, technical personnel from AFPRO and local NGO partners worked closely with the village communities to understand the nature of realities that confront them and devise suitable ways and means to resolve the obstacles.

The primary strategy was capacity building for technology transfer. Through demonstration-cum-trainings, local villagers have been trained on various aspects of construction and maintenance. Village level institutions have been empowered and given the responsibility of maintaining community structures. These trainings have also acted as platforms for creating awareness about water and sanitation issues.

In the case of bamboo leach pit latrines a simple technology to learn

Spring spot development at Rongdai, Manipur



Programs promoting low-cost technology need to be hinged on the understanding of people of the grassroots. Their participation in planning and implementation is necessary for its acceptance, ownership, mutual learning and growth. Technical personnel from AFPRO and local NGO partners worked closely with the village communities to devise suitable ways and means and provide solutions.

and replicate, a strategic emphasis is on training up locals for their construction. A special endeavor has been to promote masonry skills among the unemployed.

A spirit of participation was also carried into the preparation of this document. Personnel from AFPRO and local NGO partners who were trained in documentation visited the project areas and recorded experiences recounted by the village communities and local partners.

The experience has been one of continuous learning. Some of these have to be underlined in conclusion:

- Community-level technololgies like HRF-SSF are maintenance heavy. In the absence of other equally good alternatives, they work well. They are, however, rapidly discarded in favor of better alternatives. Users of a HRF-SSF, for instance, would like to switch over to a less maintenance-dependant alternative like deep bore wells as soon as this is made available to them.
- Families sometimes change from a low-cost alternative to a high-cost one to cater to their prestige and self-esteem. The link between low-cost and low ecological impact, has to be established through effective awareness generation. However, this will always depend on the free choice of each individual.
- To an extent, the acceptance of a change in personal habits of hygiene, water collection and storage, are more important than the acceptance of the new technologies themselves. This follows from a demonstration of the relative advantages of improved practices. For instance a, neighbor who has started using a latrine acts as a positive reinforcement of the message of sanitation - health and increased well-being.

The acceptance of a certain change in personal habits of hygiene, water collection and storage, are more important than the acceptance of the new technologies themselves. An urgent and wider manner of communication needs to be taken up immediately by the government and development practitioners. Local program partners (NGOs) need to be capacitated as resource agencies themselves.

While this will take time, an urgent and wider manner of communication needs to be taken up immediately. Hoardings in towns and markets, posters, radio and television channels: the government and development practitioners have to walk that extra mile to bring the friendly technologies home to the Northeastern villages.

FUTURE STRATEGIES

While the strategies for the future may be obvious to the trained practitioner, it is necessary to dwell over them briefly.

The first of them would be to immediately build upon the awareness created. The low-cost technology already promoted needs to be provided to a larger number, and accepted by them. The communities need to be strengthened and motivated to replicate structures on their own. Training them for effective utilization and maintenance also has to be intensified.

The technology needs to be further improved upon, keeping in mind the feedback from the community and observedlimitations. Accommodation of indigenous knowledge and flexibility in all such technology is necessary and has to be ensured through a participative approach.

An urgent issue is capacitating the local program partners (NGOs and community representatives) as resource centers of standing. This requires extensive training exercises for staff and volunteers working with such agencies.

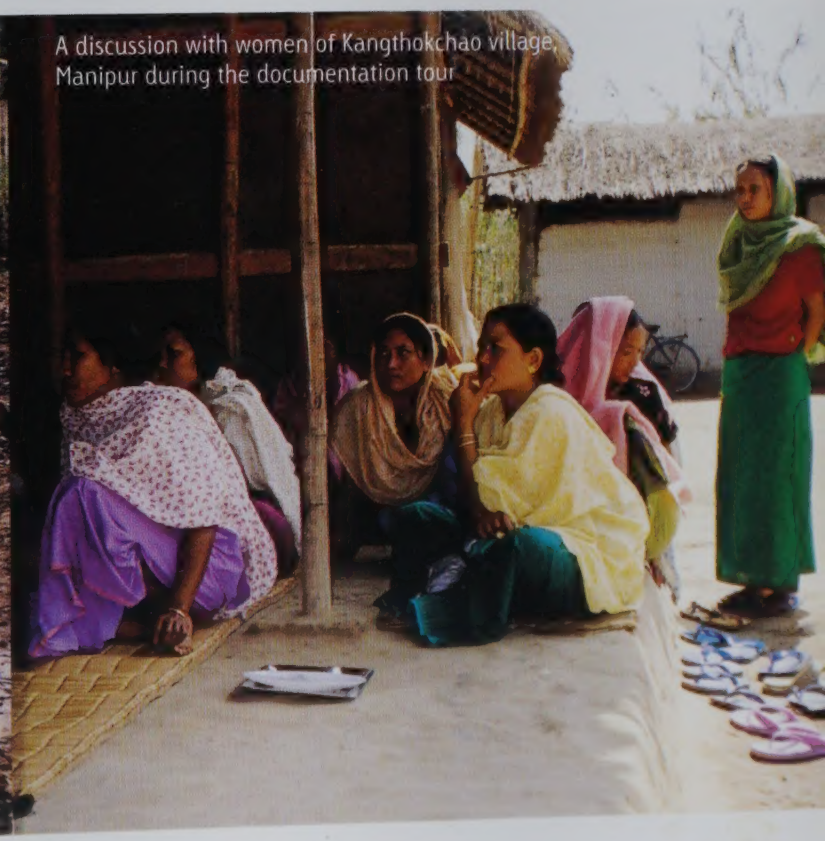
It is also very important to disseminate all successful technology all over the North-east for cross-learning. This has to be taken up on a large scale, both in the printed and electronic forms.

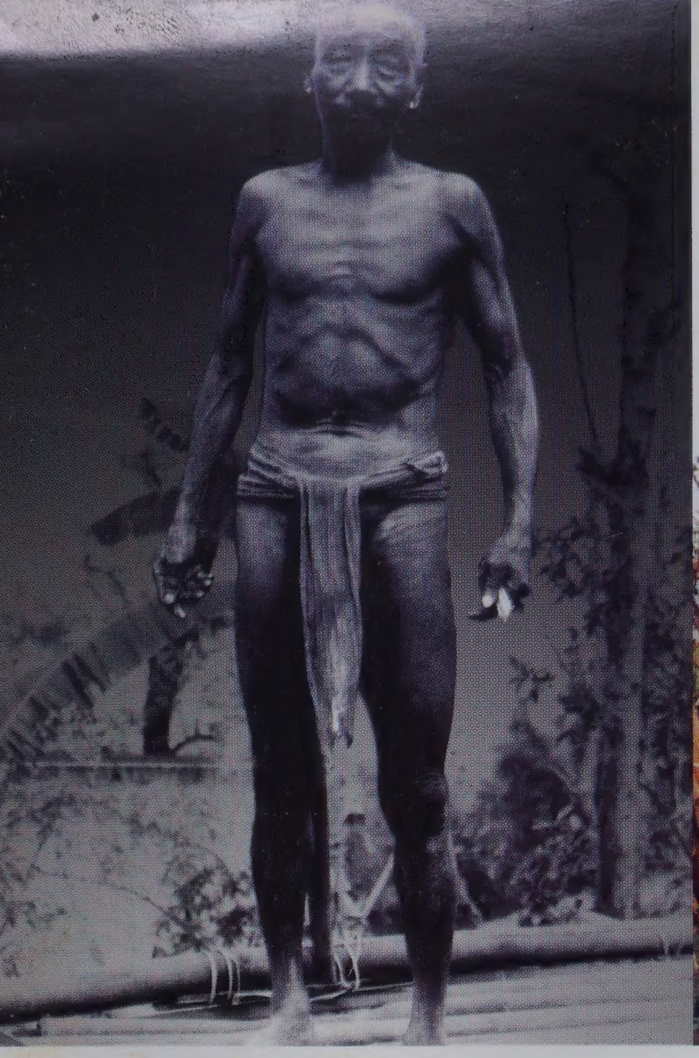
FIRMING UP

Having worked with many NGO partners in the Northeast, AFPRO has noticed a strong will and determination among them to see their states on the path of sustainable development. Their understanding of processes and cooperation led to the formation of Blue Mountain Network for greater coordination. This network of EED-AFPRO Program partners was set up for wider consultation and mutual sharing of experiences.

The enthusiasm and energy that flows from communities is in itself an eye-opener. Open and frank in their participation, they have once again confirmed the need and success of participatory approaches in development. Their candid responses reflect a bright intellect and responsible mindsets. Their understanding of development came

GFS Reservoir at Muktina village, Manipur


A discussion with women of Kangthokchao village, Manipur during the documentation tour



The understanding the villagers had of development came forth very clearly- benefits to few individuals, as in the case of low cost latrines, would not reap immediate benefits for the whole community and activities need to be taken up on larger scales. What shone forth was their understanding of human dignity and desire for a better life.

forth very clearly - benefits to few individuals, as in the case of low cost latrines, would not reap immediate benefits for the whole community and activities need to be taken up on larger scales. Again in many cases, they were able to identify improved water conditions as the cause of a reduction in diseases in their villages.

Most importantly, the fact that shone forth from village level discussions was the understanding that these simple villagers had of human dignity, and their desire for a better life. This can be seen in rudimentary but analytical attempts at sanitation - whether it be the open-pit latrine or the 'Kamki', or the happiness expressed by many at being able to take regular baths and get clean water for drinking. In villages Nginnu and Ngissa, the Water Committee representatives said, "The younger generation needs much more water than the old generation. And when water reaches all corners of the village the people will be living a more comfortable life. Everybody would take care to maintain cleanliness and neatness. Even animals and ducks could be reared in such a situation."

However, implementing projects has not been easy in some cases. Relates Sujan Thomas of Sewa Kendra, "At times our plans and time schedules are thrown in jeopardy. In one of the villages, we planned to construct toilets and took raw materials along. On reaching the site, we were taken unawares by the presence of insurgents. We unloaded the raw materials at a suitable location and left. On coming back later, however, we discovered that the raw materials had disappeared." Such cases are not infrequent. In another case, the AFPRO technician and local partner representative had to remain in the village for a few days in a similar circumstance, causing a delay and shortening the time available for work.

But the enthusiasm of the common villager, the joy of the children taking bath and the twinkle in the eyes of the elderly, all looking forward to an improved life, would firm up the sense of purpose that any visitor to these interior villages would be nurturing at heart.

A profound learning that we carry forward from our work in the Northeast is that efforts at redefining lives depend on the definition of one's own values and motives. Commenting on the nature of processes at the grassroots, Fr P K George, Chief Functionary of Sewa Kendra, says, "It's not just what you do, but how you do it that counts. It is necessary that we reach out to the people." Echoing the same sentiments, Mumai Pheiga, the Chief Functionary of RNBA says, "We have to build a trust with the people and honor it".

ABBREVIATIONS

AFPRO	Action for Food Production
EED	Church Development Services (Evangelischen Entwicklungsdienst)
GFS	Gravity Flow System
HRF-SSF	Horizontal Roughing Filter and Slow Sand Filter
IRDSO	Integrated Rural Development Service Organisation
NGO	Non-Govermental Organization
PRA	Particpatory Rural Appraisal
RBA	Rongmei Baptist Association
RNBA	Rongmei Naga Baptist Association
RWUS	Rural Women Upliftment Society

RESEARCH, TECHNICAL INPUTS AND PHOTOGRAPHS
Anwar Kamal, R K Pandey, C M Muralidharan, Mumai Pheiga (Rongmei Naga Baptist Association, Manipur), Darthangmawi (Rural Women's Upliftment Society, Churachandpur), Sujan Thomas (Seva Kendra, Arunachal Pradesh), Ehsan H Rizvi, G Sampat, Sunil Augustine, Aparajita Raj, Anubha Deb, Moina Sarma, Sunil Simon.

EDIT
Bidisha Fouzdar (Consultant), C M Muralidharan, Sunil Augustine

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Ronald Joseph, Ashish Rozario

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Ashish Rozario

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25/1A, Institutional Area, D Block, Pankha Road, Janak Puri, New Delhi 110 058
+ 91 11 25555412, 25553652 fax + 91 11 25500343
afprodel@afpro.org www.afpro.org

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AFPRO is a non-profit, non-governmental socio-technical development organization with Christian inspiration that provides technical support and backup support to grassroots level NGOs for the implementation of environmentally sound projects of food security and livelihoods.
Our core competencies are water and sanitation, watershed management, sustainable agriculture, fisheries, livestock, forestry and rural energy.

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